

40 kHz · Crystal Controlled

ULTRASONIC TRANSMITTER

Model: GS-400



OPERATION MANUAL

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Before You Begin

What this instrument is

The GS-400 is a transmitter. It produces a steady 40 kHz ultrasonic tone and nothing else — it has no display, and it detects nothing on its own.

It is used together with an ultrasonic leak detector such as the Lutron GS-5800. The transmitter goes on one side of a barrier; the detector is swept along the other side. Wherever sound passes through, there is an opening.

Without a detector, the GS-400 cannot do anything useful.

Why a transmitter is needed

An ultrasonic leak detector works by hearing gas escape through an opening. That requires pressure or vacuum behind the opening to drive the flow. A door seal, a window gasket, a windshield or a roof penetration has no pressure behind it — there is nothing for a detector to hear, even when the gap is plainly there.

The transmitter supplies the sound that is missing. Sealed inside the space, it floods the interior with 40 kHz ultrasound, and any opening in the envelope becomes a path that sound can take. The detector finds that path from the outside.

Read this manual completely before operating the transmitter, and keep it with the instrument for future reference.



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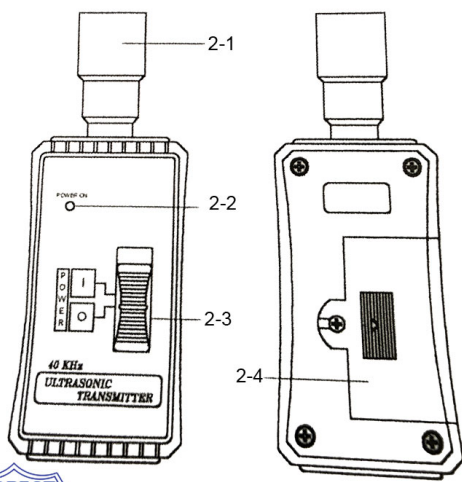
1. Features

- Produces a steady 40 kHz ultrasonic tone for leak path testing with an ultrasonic detector.
- Crystal controlled oscillator — a 640 kHz time base divided by 16 — so the output frequency stays stable as the battery ages and as temperature changes.
- Locates openings that have no pressure behind them, which an ultrasonic leak detector cannot find on its own.
- Single slide switch operation, with nothing to set or adjust.
- Power indicator confirms the unit is running, and signals when the battery needs replacing.
- Compact and light enough to set inside a vehicle, a duct or a wall cavity and leave running while you work outside.
- Powered by a single 9V battery.

2. Specifications

Frequency output	40 kHz.
Oscillator circuit	640 kHz crystal time base, divided by 16.
Power indicator	LED, lit when the unit is switched on.
Operating temperature	32 to 122 °F (0 to 50 °C).
Operating humidity	Less than 80% RH.
Power supply	One 9V (006P, MN1604, PP3) alkaline or heavy duty battery.
Power consumption	Approximately 7.5 mA DC.
Weight	4.3 oz (122 g), battery included.
Dimensions	5.7 x 2.0 x 1.0 in. (146 x 50 x 26 mm).
Accessories included	Operation manual.
Used with	Ultrasonic leak detector, such as the Lutron GS-5800.

3. Front Panel Description



Item	Description
2-1	Transmitter head
2-2	Power indicator
2-3	Power On/Off switch
2-4	Battery cover and compartment

The transmitter head is directional

Ultrasound at 40 kHz does not spread evenly in all directions — it leaves the head in a beam.

Inside a small space such as a car this matters little, because the sound reflects off every surface and fills the cabin.

In a large or irregular space, aim the head toward the area being tested, or move the transmitter and sweep again.

4. Measuring Procedure

1. Slide the Power On/Off switch (2-3, Fig. 1) on the front panel to the on position. The Power indicator (2-2, Fig. 1) lights when the unit is powered on.
2. With power on, the unit emits ultrasonic sound from the transmitter head (2-1, Fig. 1). The sound is inaudible, so the indicator light is your confirmation that it is running.
3. Slide the Power On/Off switch (2-3, Fig. 1) to the off position when the unit is not in use, to prolong battery life.

If the Power indicator does not come on, it is time to replace the battery

The indicator is the only sign the transmitter is working. If it does not light, assume the unit is not transmitting.

A transmitter that has quietly stopped produces a perfect result — no sound anywhere on the outside of the enclosure — which reads exactly like a seal with no leaks. Check the indicator before and after every test.

4-1 Using the Transmitter with a Detector

1. Switch the transmitter on and confirm the Power indicator is lit.
2. Place the transmitter inside the space being tested — the vehicle, the room, the duct, the enclosure — roughly in the middle, and away from the seal you are about to check.
3. Close the space completely: shut the door, the window, the hatch or the access panel as it would normally be.
4. Working outside, sweep the ultrasonic detector slowly along every seam, seal and joint. Start at the detector's highest sensitivity setting.
5. Where the detector's tone rises and its display climbs, sound is passing through. Reduce the detector's sensitivity and sweep that area again to pinpoint the opening.
6. Mark each leak path found, then move on to the next seam.
7. Switch the transmitter off when testing is complete.

Getting a clean result

Move the transmitter and repeat the test on large enclosures. One position may not reach every corner.

Sweep slowly and hold the detector a consistent distance from the surface, so readings can be compared to one another.

A very leaky seal can flood the whole area with sound, making everything read high.

Reduce the detector's sensitivity until the strongest point stands out, fix that one, and test again.

5. Applications

The following applications use the ultrasonic transmitter together with an ultrasonic leakage detector such as the Lutron GS-5800.

5-1 Air Leaks Around Door Seals

Place the transmitter inside the room, cabinet or vehicle and close the door. Sweep the detector around the full perimeter of the closed door, following the seal. Gaps at corners, the latch and along worn or a compressed gasket all show up as a rise in the tone.

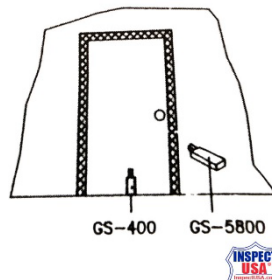


Fig. 2 — Air leaks around door seals

5-2 Air Leaks Around Window Seals

Place the transmitter inside and close the window. Sweep the detector along the sash, the frame and the glazing seal. This finds infiltration paths on a building envelope without a blower door, and finds failed glazing seals on a vehicle.

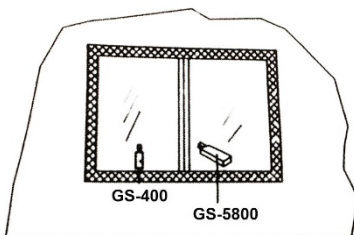


Fig. 3 — Air leaks around window seals

5-3 Water Leaks in Roofs

Place the transmitter in the attic, the ceiling void or the space directly beneath the roof area in question. Sweep the detector across the roof surface from above, paying attention to penetrations, flashings, valleys and seams.

The value here is timing. A water leak announces itself only after water has already entered the building and done damage. An ultrasonic sweep finds the opening while the roof is dry.

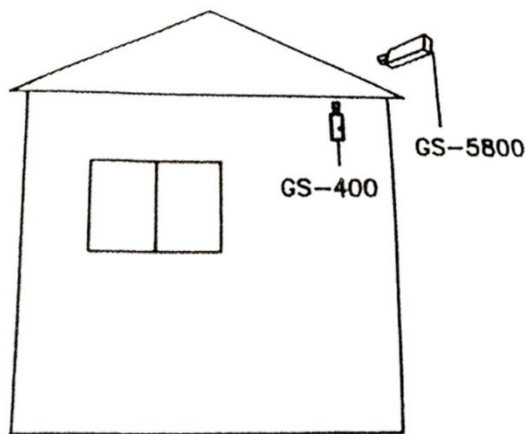


Fig. 4 — Water leaks in roofs

5-4 Conduit and Pipe Identification

Place the transmitter at the open end of a conduit or pipe run. Move the detector along candidate runs at the far end, or at intermediate pull boxes and junctions, until the tone is heard. That is the run the transmitter is sounding into.

This traces which conduit goes where without energizing anything and without opening up walls.

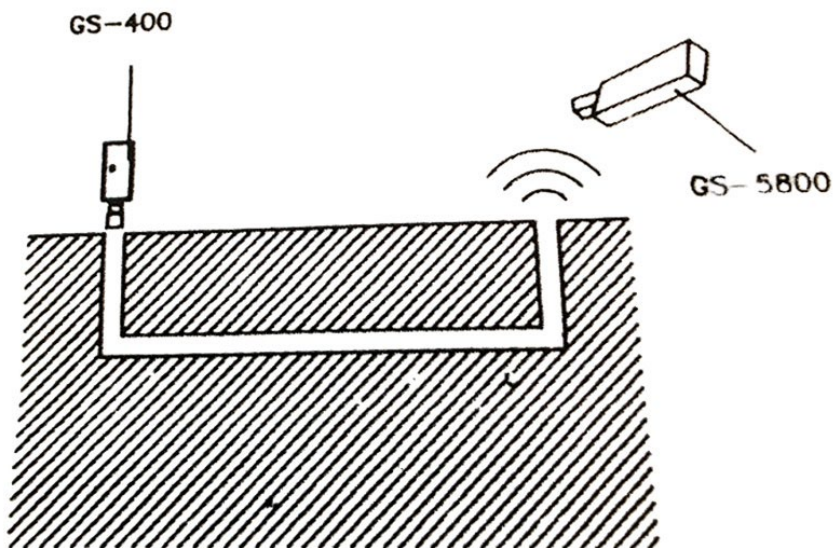


Fig. 5 — Conduit and pipe identification

5-5 Windshield Leaks

Place the transmitter inside the vehicle and close all doors and windows. Sweep the detector along the outside of the windshield seal, the rear glass, and the door and trunk seals.

Wind noise and water leaks on a vehicle almost always trace to a specific short section of gasket. This finds it in minutes, on a dry car, without a hose test.

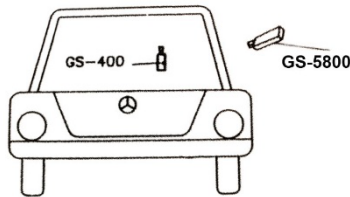


Fig. 6 — Windshield leaks

5-6 Other Uses

- Door and trunk seals on vehicles.
- Duct and plenum leak location.
- Enclosure, cabinet and control panel seal verification.
- Building envelope and weatherization surveys.
- Checking a repair — run the same test again after resealing to confirm the path is closed.

Applications that do not need the transmitter

Anything already under pressure or vacuum makes its own ultrasonic noise, and the detector finds it alone.

That includes compressed air lines, refrigeration and air conditioning systems, steam traps, tires, engine seals and electrical arcing.

Use the transmitter only where there is no pressure difference to create sound.

6. Battery Replacement

1. If the Power indicator (2-2, Fig. 1) does not come on when the unit is switched on, replace the battery.
2. Slide the Power On/Off switch (2-3, Fig. 1) to the off position.
3. Open the battery cover (2-4, Fig. 1) on the back of the unit and remove the old battery.
4. Fit a fresh 9V (006P, MN1604, PP3) alkaline or heavy duty battery, observing the polarity.
5. Refit the cover and switch the unit on to confirm the indicator lights.

Battery care

Switch the transmitter off between tests. It is easy to leave it running inside a closed vehicle and find it flat the next day.

Remove the battery if the instrument will be stored for more than a month. A leaking cell will ruin the battery compartment.

Do not leave the unit in a vehicle in hot or freezing weather. Most batteries are not rated for use below -4 °F or above 125 °F.

7. Troubleshooting

Symptom	What to check
Power indicator does not light	Replace the battery — see section 6. Check the battery polarity and that the cover is fully seated.
Detector hears nothing anywhere on the enclosure	Confirm the transmitter's Power indicator is still lit. A transmitter that has stopped reads exactly like a perfect seal. Confirm the detector itself is working — test its battery, and sweep it close to the transmitter head to verify it responds. The enclosure may genuinely be tight.
Detector reads high everywhere	A large opening is flooding the area with sound. Lower the detector's sensitivity until one point stands out. The space may not be fully closed — check for an open vent, window or access panel.
Result differs from one test to the next	Move the transmitter to the same position each time, or note where it was placed. Sweep the detector at a consistent distance and speed.
One area of a large space reads low	The transmitter head is directional and the space may be too large or too irregular for one position. Move the transmitter closer to that area and repeat.
Nothing found on a pressurized system	The transmitter is not needed there. A pressurized system makes its own ultrasonic noise — use the detector alone.



Notes

8. Service and Support

For technical support, accessories, replacement parts or calibration, contact us through the Contact Us form on our website.

How to reach us

Use the Contact Us form at www.inspectusa.com/contact

So we can help you on the first reply, please include:

- Your InspectUSA order number.
- Your name and contact information.
- The model number of the instrument (GS-400).
- The serial number from the instrument.
- A brief description of what you need assistance with.



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Specifications, accessories, downloads and support

Appearance and specifications are subject to change without notice.

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